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Institutional Grafting as a Three-Dimensional Phenomenon

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Abstract: This study introduces a comprehensive model of institutional grafting by examining the formation of legal institutions as shaped by three forces: (1) cultural, (2) structural, and (3) political. The model is used to argue that a country's growth rates are a function of the distance that new legal institutions develop to these three forces. We demonstrate that the potential size of such distance varies depending on the phase of institutional change in which legal institutions emerge: drift/evolution or critical junctures. When a country drifts along the established institutional path, the distance is likely to be minimal, enabling rapid economic development. When a country changes its institutional path, the distance proves large and hinders economic growth. These propositions are tested empirically based on a sample of 53 countries for the period from 1996 to 2008. The post-communist transition is used as an example of critical junctures.

Keywords: institutional economics, formal institutions, institutional change, post-communist transition

JEL classification: O43, O57

^{*} Please note that this paper is a first draft only. For a more advanced discussion and a more extended empirical analysis, please see a later version of this manuscript.

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Introduction

Growth theory asserts that good formal institutions are conducive to rapid economic development. Empirical evidence from economically developed and developing countries largely supports this statement (Chen and Feng 1996; Eicher and Leukert 2009; Klomp and de Haan 2009; Rodrik, Subramanian, and Trebbi 2002). Post-communist economies are either excluded from this analysis, because they represent a particularly unusual group (Bosworth and Collins 2003) and lack data for reasonably long periods. Or they are addressed independently by research that reduces the definition of their formal institutions to political indexes (Grogan and Moers 2001), or progress in economic reforms (Falcetti, Lysenko, and Sanfey 2006; Fidrmuc and Tichit 2009) while omitting legal institutions, such as property rights and contract enforcement legislation, from their analysis.

This gap is filled by Eastern European scholars who often point to certain peculiarities in institutional effects that impact economic growth during a transition. In contrast to the conventional view, they assert that introducing legal institutions per se may rarely lead to economic prosperity in the former soviet economies (Mau 2008; Polischuk 2008; Polterovich 2008). Their institutional reforms are believed to promote only the redistribution of economic or political power without causing any substantial change in economic growth (Dementiev and Vishnevskiy 2011).

Growth theory does recognize that heterogeneity is possible in the effects of formal institutions on growth rates, attributing its sources to either the level of maturity of formal institutions (Barro 1997; Fidrmuc and Tichit 2009) or a country's level of economic prosperity (Eicher and Leukert 2009; Lee and Kim 2009). We question whether these two

explanations are appropriate for post-communist countries. These countries began their institutional reforms from a relatively similar platform with only minor variations in the levels of their economic development and the type and degree of institutional maturity. However, they experienced very different success rates in terms of their economic performance. We argue that the distinct relationship between formal institutions and economic growth in the post-communist area can be better explained if one describes the transition as the process of changing their institutional path. Hence, one must understand features of institutional shifts at critical junctures.

The latter proposition requires constructing a theoretical model that juxtaposes the logic of institution building during drift/evolution versus at critical junctures to identify possible implications that these two institutional formation processes imply for a country's growth dynamics. For the purpose of this research, we narrow the concept of formal institutions to legal institutions, such as property rights and contract enforcement legislation, since they are keys to economic growth (North 1990) and have been the least successfully reformed in post-communist countries (Aslund 2007).

Theoretical Model

Institutional economics distinguishes between two phases of institutional development: drift/evolution and critical junctures. The first describes institutional change that occurs in small cumulative stages within an established institutional path. The second considers radical changes that result from a country's exposure to shocks sufficient to break society out of the outmoded, suboptimal path and shift into a new one (Acemoglu and Robinson 2012). Each phase of institutional change is characterized by a distinct logic of the institutional formation process, affecting economic development in a certain way.

We introduce a new conceptual framework to juxtapose the two possible instances in the dynamics of legal institutions. Since we primarily focus on post-communist transition economies, our point of departure is derived from the logic of a free-market economy defined as an economic system based on the exchange of goods and services between economic agents at market prices (Aslund 2007). Given this definition, we suggest that the formation of legal rules regulating the exchange process can be understood by accounting for: (1) economic agents' values and attitudes concerning production and exchange processes; (2) the economic system's structural elements in which production and exchange occur; and (3) the behavior of actors who devise legal rules that regulate interactions between economic agents. Based on this logic, we present institutional grafting as shaped by three forces that correspond to three dimensions of the institutional space: (1) cultural, (2) structural, and (3) political.

The first dimension includes cultural values (Boettke, Coyne, and Leeson 2008; Portes 2006) that are similar to North's concept of informal institutions (North 1990). For simplicity, we confine culture to the following four aspects: control, respect, trust, and obedience (Tabellini 2008). Control reflects the extent to which a person's individual effort is rewarded (Tabellini 2008). Respect and trust govern people's attitudes towards interacting with one another (Shikida, de Araujo Jr., and Sant'Anna 2011). Obedience reflects the likelihood that individuals abide by formal or informal rules/agreements (Shikida, de Araujo Jr., and Sant'Anna 2011).

The second dimension is structural and encompasses economic forces that reflect a country's economic infrastructure and the nature of economic arrangements. It predefines the extent to which a country's economic system is in tune with the logic of free-market economic processes. As such, we select the following aspects of the free-market economic structure: privatization, competition, price liberalization, trade liberalization, and capital

market creation (Aslund 2007). Common sense suggests that exchanges can only be established on the basis of private ownership of the means of production and hence require privatization. To ensure market efficiency for the exchange of goods, free competition and the deregulation of prices and trade must exist. Finally, real capital markets must also be established to enable the rational allocation of capital.

The third dimension is called political and includes two political forces (Portes 2006): (1) the balance of power between the main political actors and (2) the quality of political institutions. Regarding the first aspect, we distinguish between three main political actors involved in the formation of legal institutions: political elites, economic elites, and the broad population. Political elites deal with the formalization of new institutions and can possess a certain level of political control consistent with their ability to protect their own power, mainly through access to the country's military resources. Economic elites stem from Olson's idea of vested interests (Olson 1982), which are reduced to business interest groups in society and their ability to promote rent-seeking through the institutional framework. The broad population reflects the potential level of resistance from the masses to formal institutions that are already in place or institutional change being promoted by political and/or economic elites. The interests that prevail are expected to shape the main features of legal institutions. When the balance of power shifts towards political or economic elites, more extractive formal institutions emerge, whereas more inclusive institutions emerge when the population's interests dominate (Acemoglu and Robinson 2012; Aslund 2007). In turn, political institutions comprise the rules that formalize the prevailing interests into a legal framework. In line with the hierarchy of institutions hypothesis (Eicher and Leukert 2009), they are assumed to be exogenous to legal institutions. Their quality and flexibility predefine how far and how fast existing interests are incorporated into a new legal institutional framework (Davis 2010).

It is believed that the three dimensions are related to each other in some way. However, that issue is beyond the scope of our analysis. Instead, we suggest that legal institutions should be commensurate with the logic of each of the three dimensions in order to function effectively and promote economic development. Consequently, economic growth is viewed as a function of the level of congruence between new legal institutions and these three dimensions: When they appear to be more compatible, fewer frictions emerge during the exchange process, making more transactions possible and leading to higher rates of economic growth. We further argue that the level of this congruence may vary across the phases of institutional change (drift/evolution or critical junctures) and can be *a priori* identified from the logic of institution building in each of these phases.

From this perspective, the logic of the (evolutionary) institutional change that occurs during a drift along the established institutional path can be described as follows. As economic agents operate, they accumulate knowledge and experiences, which leads to technological advancements and further promotes the division of labor (Davis 2010). This changes the organization of production processes in a country and shifts the structural dimension by establishing new industries, competition terms, pricing mechanisms, and conditions of resource allocation across various economic sectors. Profound change in the economic domain may also lead to the evolution of values and attitudes. Changes in the division of labor or the levels of specialization may involve more interactions during production processes and encourage higher levels of trust and respect among economic agents to support such exchanges. Similarly, new technologies may shift the perceptions of economic agents about potential rewards for their efforts and give rise to new organizational modes in their businesses. As a consequence, existing legal institutions may no longer be commensurate with both structural and cultural dimensions, thus raising market transaction

costs (North 1990). Contractual arrangements create demand for institutional change that lowers transaction costs in exploiting new opportunities (Pejovich 1999).

In trying to bypass existing inconsistencies, economic agents start to introduce informal changes (Eggertsson 1997) in formal “rules of the game” to make the institutional framework more flexible. Initiated from within the economy, these informal changes are expected to be fully commensurate with prevailing cultural values and the economy's new structural characteristics and are derived from the country's current levels of obedience, which ensures their enforcement. If these changes are efficient and compatible with the interests of political elites (Portes 2006), they are adopted by the political system, which formalizes them through existing political institutions, giving them the status of formal legal institutions. Since the need for institutional reforms arises from economic agents' functioning, there can be no essential change in the balance of power or the emergence of frictions between the main political actors or the political institutions in force. However, the flexibility of political institutions predetermines how rapidly legal institutional reforms meeting the new demands are implemented (Davis 2010). The evolution of money (Boettke, Coyne, and Leeson 2008) is a classical example of drift-phase institutional reforms.

The logic of institutional evolution in the drift phase entails the following: First, the formation process is initiated by economic agents, as a result of which new legal institutions are likely to be congruent with the cultural dimension. Second, legal institutions are expected to be fully compatible with the structural dimension, since any change in the old institutions largely occurs as a reaction to changes in economic processes or technologies. Third, the role of political elites in institution building is relatively inferior and restricted to the formalization of institutional change that previously emerged at the micro-level. Overall, these three features imply that institutional reforms during the drift phase are likely to produce legal institutions that are fully commensurate with the three dimensions.

The logic of institutional reforms at critical junctures differs substantially from the drift-phase logic. Critical junctures are characterized by radical change of the political order that may occur through revolutions (Acemoglu and Robinson 2012) as recent events in Arabic countries demonstrate. Or, these phases may take place in a peaceful manner without wars and coups (Olson 1982) as in the majority of post-communist countries after the collapse of socialism (Aslund 2007). The economic crisis, caused by shortcomings of the previous regime and discontent among the population with the current conditions, usually serve as the main drivers behind this political change.

The latter alteration generally leads to changes among political elites and introduces new political institutions to legitimize the new political regime. Additionally, the economic system must adjust to the new political logic, which explains the need for adopting new legal institutions that are commensurate with the new political principles concerning economic relations. Many pitfalls exist at various stages of carrying out institutional reforms at critical junctures. First, a shift in the political power and the initial immaturity of new political institutions may create a temporary vacuum of power and opportunities for political and economic elites to seek rents through the new legal institutional framework (Aslund 2007). Second, even if this is not the case and the population's interests dominate in the process of building a new legal institutional framework, the quality of the new legal institutions ultimately depends on whether political elites incumbent to handle the institutional formation process are sufficiently familiar with the new economic system and relevant legal rules. Third, since such knowledge and skills are often missing, it is likely that building a new institutional framework involves borrowing legal rules from countries with political and economic orders close to those desired. As a result, the new legal institutions become imposed from without (Pejovich 1999), which could lead to two kinds of problems.

On the one hand, implanting foreign institutions into another local context may disturb their congruence with characteristics of the structural dimension already in force. The introduction of Western industrial legislation in CIS countries is a good example of this. The new rules proved inefficient for post-communist economic systems, since Western legislation was designed for postindustrial societies with a prevalence of medium and small businesses, while many CIS economies were characterized by the overrepresentation of large (state) enterprises (Polterovich and Popov 2006). Reforms may be necessary to transform the structural dimension and hence narrow the differences between the recipient- and source-countries of legal institutions. If this need is not recognized and institutional change is expected to generate the required structural change, then new legal institutions, even those of good quality, may appear suboptimal in the new conditions (Eggertsson 1997).

On the other hand, a similar incongruence may also emerge between new legal institutions and the local cultural dimension (Boettke, Coyne, and Leeson 2008; Kyriazis and Zouboulakis 2005; Portes 2006). Because culture is unique, economic agents may perceive and interpret the newly imported legal institutions through the prism of their specific values, as a result of which the meanings assigned by economic agents to new laws might appear completely different from their initial context (Portes 2006). The imported legal institutions may, for instance, be designed to supplement certain levels of trust and respect that can be different from levels actually existing in the recipient society. Efficient enforcement of new laws may also require a certain level of obedience that could differ from what is actually internalized by local economic agents. Such inconsistencies may further lead to a mutation of new legal institutions (Vernikov 2009) or low levels of their enforcement (Portes 2006). Political bodies that adapt new legal rules to the peculiarities of national cultures or advertise the superiority of new values to local economic agents may ensure that local cultural values smoothly blend with the logic of new legal institutions.

In theory, it is unlikely that both kinds of incongruence can be entirely eliminated when the transition from an old to a new institutional path begins. The learning experience is expected to minimize or eliminate them (Nelson and Sampat 2001). If policymakers design and introduce adjustment policies for the orderly operation of the system at each stage of the transition period, the gap between new legal institutions and economic structures is believed to be gradually narrowed. Similarly, if economic actors learn that acting according to new rules can expand their opportunity set, they may shift their values (Eggertsson 1997) and conform to the new culture. The existence of learning processes implies, however, that there will be some lags between the initiation of fundamental institutional change and the point at which relevant actors get the three dimensions right (Eggertsson 1997).

One can derive the following features of the path-breaking process of institution formation at critical junctures: First, institutional change is profound and may include the introduction of radical institutional reforms by implanting foreign institutions into the local systems. It is likely that these legal institutions will be incompatible with existing cultures, at least at the initial reform stage. Second, similar distances may exist between the new legal institutions and the current economic structures for the same reason as above. Third, the role of political elites is superior and cannot be confined to legalizing new institutions but extends to their selection, design, introduction, and subsequent adjustments to the cultural and structural dimensions in place. The quality of new legal institutions might hence depend on the quality of the country's political change and the professionalism of political elites incumbent to handle institutional grafting under the new conditions. In sum, these three features suggest that institutional change at critical junctures is unlikely to produce legal institutions that are fully congruent with our model's three dimensions.

One should note that this is only a general distinction as we solely described two ideal cases. Various hybrids that re-combine features from both types of institutional formation are

certainly possible. Even when the country does not deviate from the old institutional path, policymakers may, for instance, intervene in the formation of institutions by introducing rules of the game that were previously foreign to the system. Such reforms however concern only a few institutional elements so that the total institutional change is relatively small and cannot cause the emergence of any distance between legal institutions and the cultural, economic, or political dimensions. The opening of previously closed professions in Greece, which required only a few adjustments in the competition law, is a good illustration of this case. Profound institutional change may also happen but only incrementally, as substantial alterations in legal institutions or in the entire institutional framework occur slowly (Efendic, Pugh, and Adnett 2011), giving enough time for the three dimensions to co-evolve with legal institutions.

The odds of ensuring congruence between the new legal institutions and the three dimensions differ substantially for the two phases of institutional dynamics. This allows us to conclude that economies might be endowed with different opportunity sets for growth, depending on the phase in which new legal rules emerge. We now postulate three implications that our analytical framework offers to growth theory.

Implication 1: Legal institutions that emerge during a drift phase are more likely to be compatible with the three dimensions and will more effectively enhance economic development than legal institutions introduced at critical junctures.

Implication 2: Since institutional change at critical junctures is usually radical and profound, it may require a learning process for both political elites and economic agents at least in the short run. Political elites need some time to experiment and learn how to design and operate new formal institutions. Economic agents must also gain experience operating under the new rules. The learning processes might also be non-linear, and as institutional elements approach an optimal design, they must induce a better learning process.

Implication 3: Since institutional change at critical junctures presupposes a transformation of the entire institutional framework and the introduction of a totally new set of legal institutions, economic development becomes a function of the experience and skillfulness of politicians who handle the institutional design. Their ability to choose the appropriate set of institutions predetermines the extent to which institution building processes are successful and newly imported legal institutions are of good qualities. Their ability to introduce measures aimed at adjusting the cultural and structural dimensions to the new legal rules predetermines whether these legal institutions will survive and function effectively. By contrast, institutional reforms during the drift phase are characterized by insignificant cumulative changes and seldom require the government to institute such adaptation measures.

Based on these propositions, we postulate six hypotheses:

Hypothesis 1: Countries that minimize the distance between the logic of their legal institutions and the three dimensions are expected to exhibit better economic performance.

Hypothesis 2: Legal institutions are expected to develop a closer relationship to economic growth when they emerge during the drift phase rather than at critical junctures.

Hypothesis 3: Political institutions are expected to develop a closer relationship to economic growth at critical junctures than during the drift phase.

Hypothesis 4: At critical junctures, improvements in the quality of political institutions/elites are expected to lessen the negative effect of the distance variables on economic growth.

Hypothesis 5: Because of the learning process, improvements in legal institutions at critical junctures are expected to lead to non-linear improvements in rates of economic growth.

Hypothesis 6: At critical junctures, countries that manage to simultaneously improve both legal institutions and the three dimensions are expected to have greater improvements in their economic performance on the new institutional path.

Data and Method Description

To test our hypotheses, we use Eicher's and Leukert's (2009) approach of splitting the sample into subsamples and conducting an empirical analysis for each of them separately. Our first subsample includes post-communist transition countries that are considered a good example for the path-breaking process of institution building. They exhibit sufficient variations across the three dimensions, legal institutions, and the overall success levels concerning economic performance. They also experienced the shock of transitioning from socialism to a new path at a relatively similar time.

The subsample for the drift economies includes developed and developing countries that (1) have not experienced any recent radical change in their political regime and are considered as being in the drift phase of institutional development; and (2) have participated in at least one wave of the World Values Survey (WVS) during the analyzed period from which many operationalizations are sourced. To ensure that the difference in the subsample sizes does not lead to differences in coefficients or their significance tests, we kept the second subsample relatively small. Appendix 1 lists the countries included in each of the subsamples.

In line with Pääkkönen's study (2010), we use yearly data for the period from 1996 to 2008. We exclude the first transition years from the analysis since the outset of transition entailed profound systemic changes (Fidrmuc 2003) or a deep economic recession. A total of 53 countries is used, with the drift subsample containing 31 countries and the critical junctures subsample including 22 countries. They serve as the basis for our analysis but are expanded to include other countries if operationalizations for them are available.

We follow Tabellini (2008) in measuring culture and source the relevant measures from the WVS. Obedience represents the percentage of people in the sample who mentioned obedience as an important factor in society. Trust and respect are positive responses to

questions about trusting most of the people and whether most people show tolerance and respect towards others. Control is operationalized through the question about how much freedom of choice and control people have over their own lives. The aggregate variable is constructed by adding up the values of control, respect, and trust, and subtracting the value of obedience as in Shikida, de Araujo Jr., and Sant'Anna (2011). The final index is rescaled to take values ranging from 0 to 1. The "culture" variable is available only on a cross-sectional basis, since many countries included in the subsamples participated in only one wave of the WVS.

The structural dimension is measured by the EBRD indexes, which report on the progress countries make in shifting towards a market economy in the following fields: price liberalization, foreign exchange and trade liberalization, small scale privatization, large scale privatization, enterprise reform, competition policy, banking reform, and non-banking financial institutions. The aggregate index is constructed by replicating Fidrmuc's and Tichit's (2009) component factor analysis that captures the extent to which the selected submeasures load on the common construct. We first calculate weights for each indicator in the aggregate index and then multiply the values of the sub-indexes by their weight scores for each year and for each country. The final index is rescaled to take values ranging from 0 to 1. The data for the economic structure is available on an annual basis but only for the set of post-communist countries.

The political dimension is operationalized through a number of indexes. We use World Bank institutional indexes (corruption control in the government, regulatory quality, and government effectiveness) to measure the quality of political elites in power. Political control is measured through a WVS question in which respondents are asked to specify how much confidence they have in the police with the responses rescaled to vary from 1 "no confidence at all" to 4 "a great deal of confidence." The extent to which a country is captured by big

interests is operationalized through WVS questions asking whether the country is run by interest groups or for everyone's benefit. We calculate the percentage of people in each country who responded positively to the second part of the question (for everyone's benefit). The population's potential level of resistance is measured through three questions that ask whether respondents would engage in the following political actions: (1) sign a petition, (2) join boycotts, or (3) attend lawful peaceful demonstrations, with each having a three-point response scale: 1 - have done, 2 - might do, and 3 - would never do. A factor analysis shows that the three questions load on the same construct and produce high reliability (Cronbach's $\alpha = 0.743$). We sum up the responses to obtain the index of resistance. A principle component factor analysis is then used to confirm that the four sub-measures ((a) the quality of political elites, (b) capture by interest groups, (c) confidence in the police, and (d) index of resistance) load on the same construct and provide a high reliability (Cronbach's $\alpha = 0.875$). We follow Fidrmuc and Tichit (2009) and construct a single measure for the political dimension by applying the component factor analysis. The values of the new variable are rescaled to vary between 0 and 1. As with the cultural dimension, the operationalization for the political dimension is only available on a cross-sectional basis since most of the measures are derived from the WVS.

We also construct a proxy for the political dimension by using the World Bank institutional indexes measuring the quality of political institutions. They are available on an annual basis and enable tracing the dynamics of the distance between the quality of political institutions/elites and legal institutions. In doing so, we only select four indexes - voice and accountability, government effectiveness, regulatory quality, and the control of government corruption - to make the new variable close to our initial measure of the political dimension. We further apply Fidrmuc's and Tichit's approach (2009) to construct a single measure for

political institutions and rescale its values to vary between 0 and 1 by accounting for the fact that the initial values of the indexes range between -2.5 and 2.5.

The quality of economic institutions is operationalized through the index of protection of property rights and legal enforcement of contracts provided by the Economic Freedom of the World. Their initial values vary from 1 (poorly defined economic institutions) to 10 (well-defined economic institutions), but are rescaled to range between 0 and 1. The descriptive statistics for the key variables are provided in table 1. Correlations between the key variables are reported in table 2.

Table 1 and Table 2 near here

To test our hypotheses empirically, we use five analytical strategies. **Strategy 1:** We demonstrate that the distance between legal institutions and the selected dimensions are important determinants of economic growth in the long run (hypothesis 1). To do so, we conduct a cross-sectional analysis for the two subsamples by averaging out values for the relevant variables over the period from 1996 to 2008. We omit the structural dimension from the analysis due to lacking data for the drift subsample. The functional form of our empirical model is as follows:

$$Y_j = \beta_0 + \beta_1 \text{Distance_to_cultural_dim}_j + \beta_2 \text{Distance_to_political_dim}_j + \beta_3 \text{Legal_inst}_j + \varepsilon_j, \quad (1)$$

where Y is GDP per capita, Legal_inst is legal institutional indexes. The *Distance* variables measure the percentage by which the development of legal institutions deviates from the trends in the selected dimensions and are calculated as follows:

$$\text{Distance} = [(\text{Legal institutional index} - \text{Dimensions' value}) / \text{Dimensions' value}] \quad (2)$$

Since we believe that there is a correlation between the three dimensions, we use a simultaneous equation model to check the robustness of our results. The basic econometric

specification consists of a series of four structural relationships that describe the behavior of the endogenous variables. More specifically, the model includes a cross-country growth equation and three channel equations, one for the country's culture, one for the country's political dimension, and the last one for legal institutions. We use an instrumental variables estimation to ensure that our structural parameters are identified. In addition, we include other control variables in the channel equations so that the number of inclusions is sufficient for the order condition for identification to be satisfied. We estimate the full set of equations jointly using three-stage least square by applying STATA command `reg3`. The functional form of the model is as follows:

$$GDP_per_capita_j = \alpha_0 + \alpha_1 Distance_to_cultural_dim_j + \alpha_2 Distance_to_political_dim_j + \alpha_3 Legal_inst_j + \varepsilon_j. \quad (3)$$

$$Cultural_dim_j = \beta_0 + \beta_1 Fract_j + \beta_2 Protestant_j + \beta_3 Catholic_j + \beta_4 Latitude_j + \phi_j. \quad (4)$$

$$Political_dim_j = \lambda_0 + \lambda_1 Fract_j + \lambda_2 Protestant_j + \lambda_3 Catholic_j + \lambda_4 Civ_liber_j + \xi_j. \quad (5)$$

$$Legal_inst_j = \delta_0 + \delta_1 Fract_j + \delta_2 Protestant_j + \delta_3 Catholic_j + \delta_4 Legal_orig_j + \theta_j, \quad (6)$$

where *GDP_per_capita* is GDP per capita averaged over the period 1996-2008. The *Distance* variables measure the distance between legal institutions and the dimensions calculated as in eq. (2). *Legal_inst* are legal institutional indexes, *Fract* is the ethnic fractionalization index, and *Protestant* and *Catholic* are the percentages of a country's population who are Protestant or Catholic, according to La Porta et al. (1999).

In line with Fidrmuc (2003), we use a civil liberties (*Civ_liber*) index as an instrument for the political dimension. The correlation between the two variables is around 0.85, while it remains considerably weaker with legal institutions or the measure of culture. We further follow La Porta et al. (1999) and Shikida, de Araujo Jr., and Sant'Anna (2011) and instrument legal institutions with the origin of the legal code (*Legal_orig*), while latitude (*Latitude*) is used as an instrument for culture. Shikida, de Araujo Jr., and Sant'Anna (2011) and Tabellini

(2008) demonstrated that such instruments are sufficiently adequate in theory to isolate the channels through which legal rules or cultures affect economic growth. Both variables are obtained from La Porta et al. (1999).

Strategy 2: We demonstrate that the short-term effects of legal and political institutions on economic growth are heterogeneous across the drift phase and at critical junctures (Hypotheses 2 and 3). To test these hypotheses empirically, we use the dynamic GMM method proposed by Arellano and Bond (Arellano and Bover 1995; Bond, Hoeffler, and Temple 2001) and well-documented in Pääkkönen (2010) and Lee and Kim (2009). It requires that the equation is first-differenced to eliminate the heterogeneity in production functions, and then an instrumental variable method is applied on the differenced model, with lagged values of the endogenous variables used as instruments for the variables themselves. To avoid an overfitting bias, we restrict instruments only to the first, second, and third lags of the respective variables, since they usually correlate most closely to the major explanatory variables (Pääkkönen 2010). We further use the STATA sub-option *collapse* to create one instrument for each variable and lag distance rather than one for each time period, variable, and lag distance. We also add the sub-options *small* to request small-sample corrections to the covariance matrix estimate. We calculate the two step estimator instead of the one step. To demonstrate the correctness of the model, we report the number of instruments generated by the model, the results from a Hansen overidentification test, and the Arellano-Bond test for AR(2) serial correlation in the residuals. We apply the same model to both subsamples while ensuring that a standard set of conditioning variables and standard periods are used. STATA command *xtabond2* is used for calculating the model parameters.

Our model takes on the following functional form:

$$\ln Y_t = \alpha \ln Y_{t-1} + \beta_1 \text{Legal_inst}_{it} + (\beta_2 \text{Political_inst}_{it}) + \beta_3 \ln K_{it} + \beta_4 \ln MS_{it} + \varepsilon_{it} \quad (7)$$

where Y is annual rates of economic growth, Y_{it-1} is one-period-lagged economic growth. $Legal_inst$ and $Politcial_inst$ measure the quality of legal or political institutions respectively and are included in the model sequentially. K operationalizes the investment in physical capital measured through gross capital formation as a percentage of GDP. MS represents the macroeconomic stability captured by annual consumer price inflation.

Strategy 3: We demonstrate that the quality of political elites/political institutions are of particular importance in mitigating the effects of the distance from legal institutions to the three dimensions on the economic development of countries at critical junctures (hypothesis 4). In doing so, we include interaction terms between the distance variables and the political institutions variables:

$$\ln Y_t = \alpha \ln Y_{t-1} + \beta_1 Political_inst + \beta_2 Distance_{it} + \beta_3 Interaction + \varepsilon_{it} \quad (8)$$

where $Politcial_inst$ measures the quality of political institutions. $Distance$ is the distance between the quality of a country's legal institutions and the three dimensions. $Interaction$ is an interaction term between the distance variable and political institutional scores. Since cultural measures are available on a cross-sectional basis, we calculate annual distances between legal institutions and the cultural dimension as differences between legal scores for every year and the constant cultural scores. Our main assumption here is that culture remains relatively stable over the period analyzed. We also transform the distance to the political dimension, by limiting it to differences between legal scores and the World Bank indexes of the quality of a country's political system and political elites that are available for all selected countries on a yearly basis. As in strategy 2, we use the Arellano and Bond dynamic GMM method for testing our hypotheses.

Strategy 4: We analyze whether the relationship between legal institutions and economic growth is non-linear at critical junctures (hypothesis 5). The latter objective is achieved by

introducing a quadratic term in equation (7) while applying the Arellano and Bond dynamic GMM method to panel data for the entire period from 1996 to 2008.

Strategy 5: We demonstrate that both the quality of legal institutions and their distance to the three dimensions are important in defining the potential for economic growth in post-communist countries (hypothesis 6). For this purpose, we carry out a prediction exercise that simulates post-communist countries' GDP per capita given their current characteristics (savings rates, enrolment rates in tertiary education, and government size) and assume that: (1) legal institutional indexes take the maximum values, (2) the quality of the three dimensions is maximized, and (3) both condition 1 and condition 2 are achieved simultaneously. The STATA gllasim option (for more details see Rabe-Hesketh and Skrondal 2008) is used for this purpose. We use cross-sectional time series for the period from 1996 to 2008 but treat them as a cross-sectional sample in which years represent cases grouped by countries. The procedure presupposes first conducting a multilevel analysis of GDP per capita and then calculating predictions. One should note that when used repeatedly, gllasim always produces a different answer, suggesting that the latter may be sampling from a distribution of the parameter estimates. To minimize this effect, we generate predictions that are repeated 100 times and are averaged out in the end, which makes the process akin to a Monte Carlo simulation. We calculate a mean value of such predictions for each country and report it as compared to the actual value of GDP per capita averaged over the period analyzed.

Empirical Results

Our empirical results support our hypotheses overall. They suggest that increasing the distance between legal institutions and the political dimension may worsen a country's economic performance (table 3, model 1). A similar relationship is found between GDP per

capita and the distance to the cultural dimension, but only after controlling for the actual quality of legal institutions (table 3, model 2). We therefore receive support for our assumption that economic growth is sensitive not only to the actual quality of legal rules, but also to their congruence with the interests of public and private actors and cultural norms/values prevalent in society (hypothesis 1). The results remain valid even after controlling for correlations between the two dimensions and legal institutions (table 4).

Table 3 and 4 near here

The analysis of the short-term relationship between growth rates and legal institutions (table 5) indicates that legal rules are strong determinants of economic growth rates during a drift phase but tend to be only weak predictors of development for countries at critical junctures (hypothesis 2). Rather, growth rates of the latter group become sensitive to the actual quality of political institutions, which is commensurate with hypothesis 3. To further understand the role of political bodies at critical junctures, we introduce interactions between political institutions and the distance between legal institutions and the three dimensions. Models 3 and 5 (table 5) suggest that an increase in the distance to the cultural and structural dimensions may slow economic growth. Their final effect is conditioned by the actual quality of political institutions: If political institutions are mature, they may cushion the negative impact of such distance, supporting hypothesis 4. We do not however find a similar relationship in the case of the political dimension (model 4, table 5). By contrast, countries do better when they manage to surpass existing political constraints and introduce higher quality legal institutions than their political systems would allow.

Tables 5 near here

Isolating the sample of post-communist countries allows us to further analyze the peculiarities of legal institutional effects on growth at critical junctures. Introducing a quadratic term into the growth equation reveals that the short-term impact of legal institutions on growth rates of transition economies might be non-linear, which is consistent with hypothesis 5 (table 6, model 2). An improvement in the protection of property rights and contract enforcement legislation may affect growth negatively, especially if they are poorly devised. Nonetheless, as institutional indexes improve, the negative effect tends to gradually turn into a positive one, which is in line with Fidrmuc's and Tichit's (2009) findings on the impact of the overall success of economic reforms on the economic development of post-communist countries.

Table 6 near here

The non-linearity in the relationship between legal institutions and economic growth that was found at critical junctures also suggests that economies may grow even if legal institutions are poorly developed. This is commensurate with the conventional idea that growth is possible even under extractive institutions (Acemoglu and Robinson 2012). Accounting for the level of legal institutions' enforcement (the corruption variable) may contribute to clarifying these unusual results. The negative sign on the corruption variable (table 6, model 5) indicates that the poor enforcement of formal institutions might be a positive determinant of a country's economic performance. Accounting for the interaction between legal indexes and the corruption variable suggests that improving enforcement levels of formal institutions, without reforming them, may hinder economic development in countries that change their institutional path (table 6, model 5). But, if both policies are

combined, the main negative effect is offset and reducing corruption begins to foster economic development.

Table 7 near here

Finally, to juxtapose the relative importance of institutional reforms and changes in the three dimensions, we conduct a prediction exercise. Table 7 reveals that improving legal institutions that are not accompanied by a positive change in the three dimensions may allow countries at critical junctures to grow faster, with the ultimate change remaining relatively modest. Better results are obtained if the values of all three dimensions are maximized. The greatest improvements in transition economies' GDP per capita are, however, gained only when both groups of determinants (legal scores and the three dimensions) attain the maximum values. This suggests that countries will only succeed in fostering economic development on a new institutional path when legal institutional reform is combined with adapting the cultural, structural, and political dimensions to the new institutional logic. We hence receive support for hypothesis 6.

Conclusion and Discussion

This study introduces the idea that institutional grafting is shaped by three forces: cultural, structural, and political. The success of institutional reforms depends not only on the actual quality of newly introduced legal institutions but also on the distance that these institutions develop to the three dimensions. The potential size of the distance is considered a function of the phase in which such institutions emerge. If countries introduce institutional reforms along the established institutional path during the drift phase, new legal institutions are expected to be congruent with the logic of the three dimensions and will hence promote their economic

development. If countries reform their legal institutions at critical junctures, the distance is more likely to be substantial. The institutional effects on growth rates may then acquire two specific features. On the one hand, legal institutions will have a problematic association with economic growth in the short run due to their incompatibility with the three dimensions. On the other hand, the quality of the political system and associated policymaking decisions is important: A key precondition for rapid economic development is a government's ability to introduce effective adjustment policies that minimize the distance between legal institutions and the local economic structure, along with the political and cultural environments.

Additional research is needed to further validate our model. The optimal test of this model would be to conduct an experiment that juxtaposes different ways of reforming legal institutions and the three dimensions on a set of economies with initially similar conditions but ultimately different levels of success. The feasibility of reforming the three dimensions as such should also be discussed. The fact that the vast majority of post-communist countries appeared to be more successful in creating market economies as opposed to democratic political systems or establishing effective capitalist cultures (Aslund 2007) suggests that the choice might be less about the optimal sequence or optimal combination of reforms, and more about what is actually possible during the transition window between the old and the new institutional path.

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Table 1
Descriptive Statistics for Key Variables

Variable	No. of observations	Mean	St. Dev.	Min.	Max.
The Drift Subsample					
GDP per capita growth	310	2.546	2.964	-15.500	10.590
GDP per capita	310	13.193	9.014	0.580	31.357
Legal institutions	274	0.666	0.192	0.240	0.960
Political institutions	310	0.580	0.924	-1.361	1.673
Cultural dimension	310	0.625	0.171	0.313	1.000
Distance to Cultural dimension	274	0.036	0.132	-0.334	0.384
Political dimension	310	0.551	0.292	0.055	1.000
Distance to Political dimension	274	0.107	0.127	-0.103	0.449
Structural dimension			Not available		
Distance to Structural dimension			Not available		
The Critical Junctures Subsample					
GDP per capita growth	210	5.723	4.317	-9.680	26.000
GDP per capita	210	7.117	3.999	1.857	20.566
Legal institutions	150	0.582	0.090	0.340	0.870
Political institutions	210	0.451	0.635	-1.557	0.816
Cultural dimension	210	0.551	0.054	0.470	0.645
Distance to Cultural dimension	150	0.026	0.097	-0.254	0.262
Political dimension	210	0.322	0.177	0.001	0.637
Distance to Political dimension	150	0.212	0.127	-0.023	0.531
Structural dimension	210	0.693	0.190	0.083	1.000
Distance to Structural dimension	150	-0.179	0.118	-0.378	0.233

Table 2
Correlation Coefficients Calculated for the Main Variables

	GDP per capita growth	GDP per capita	Cultural dimension	Political dimension	D_to Cultural_dim	D_to Political_dim	Legal institutions	Political institutions	Structural dimension	D_to Structural_dim
GDP per capita growth	1.000									
GDP per capita	-0.284	1.000								
Cultural dimension	-0.238	0.782	1.000							
Political dimension	-0.304	0.905	0.779	1.000						
D_to_Cultural_dim	-0.026	0.223	-0.200	0.333	1.000					
D_to_Political_dim	0.325	-0.758	-0.654	-0.851	0.017	1.000				
Legal institutions	-0.222	0.829	0.712	0.905	0.545	-0.547	1.000			
Political institutions	-0.296	0.903	0.768	0.993	0.341	-0.842	0.901	1.000		
Structural dimension	-0.096	0.691	0.159	0.868	0.436	-0.752	0.567	0.897	1.000	
D_to_Structural_dim	0.112	-0.373	-0.066	-0.541	0.104	0.770	0.072	-0.575	-0.781	1.000

Note: Correlations between structural indexes and their distance to legal institutions are only calculated for the subsample of transition economies, since the structure dimension variable is not available for countries in the drift subsample. Correlations between other variables are calculated based on the pooled sample of 51 countries. Due to a strong correlation that is often found between the key variables, our analysis always checks for the presence of the multi-collinearity problem.

Table 3
The Long-Term Impact of Legal Institutions on Economic Growth, by Phase of Institutional Dynamics

Variables	All countries (pooled sample)		Countries in the drift phase		Countries at critical junctures	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Distance to Cultural dimension	1.841 (0.41)	-8.145*** (-4.73)	-2.109 (-0.52)	-8.704*** (-5.19)	10.881*** (2.98)	0.768 (0.13)
Distance to Political dimension	-5.712*** (-4.05)	-1.707*** (-3.93)	-11.364*** (-4.99)	-3.147** (-2.69)	-1.955*** (-4.60)	-1.277*** (-3.27)
Legal institutions		41.951 (12.26)		36.969*** (8.13)		27.987** (2.60)
<i>R sq</i>	0.455	0.862	0.662	0.875	0.675	0.758
<i>Number of observations</i>	51	51	31	31	20	20

Note: t-values are reported in parentheses.

*p < .10. ** p < .05. *** p < .01.

Table 4
The Long-Term Impact of Legal Institutions on Economic Growth,
Simultaneous Equation Models

Variables	The GDP per capita equation		
	Pooled sample	Countries in the drift phase	Countries at critical junctures ^a
Distance to Cultural dimension	-10.086*** (-4.44)	-9.814*** (-3.81)	-12.210 (-1.38)
Distance to Political dimension	-1.277** (-2.12)	-3.002* (-1.79)	-0.258 (-0.40)
Legal institutions	47.713*** (11.43)	40.294*** (6.26)	64.174*** (2.74)
<i>R sq</i>	0.854	0.869	0.596
<i>Number of observations</i>	48	30	18

Note: t-values are reported in parentheses. We only report regression coefficients for the growth equation of our simultaneous equation models. The channel equations took the following form for the pooled sample:
 $Cultural_dim = 0.543 - 0.137Fract + 0.003Protestant + 0.001Catholic + 0.113Latitude$ ($Rsq=0.514$)
 $Political_dim = 0.623 - 0.166Fract + 0.005Protestant + 0.001Catholic - 0.075Civ_liber$ ($Rsq=0.745$)
 $Legal_inst = 0.624 - 0.175Fract + 0.005Protestant + 0.001Catholic - 0.014LO_Socialist - 0.053LO_French + 0.010LO_German - 0.153LO_Scandin$ ($Rsq=0.614$)

The channel equations for the drift subsample are as follows:

$Cultural_dim = 0.518 - 0.113Fract + 0.003Protestant + 0.001Catholic + 0.248Latitude$ ($Rsq=0.627$)
 $Political_dim = 0.803 - 0.127 Fract + 0.004Protestant - 0.001 Catholic - 0.105Civ_liber$ ($Rsq=0.782$)
 $Legal_inst = 0.652 - 0.189Fract + 0.005Protestant + 0.001Catholic + (LO_Socialist dropped) - 0.046LO_French + 0.003LO_German - 0.178LO_Scandin$ ($Rsq=0.619$)

The channel equations for the critical junctures subsample can be presented as:

$Cultural_dim = 0.363 + 0.070Fract - 0.001Protestant + 0.060Catholic + 0.310Latitude$ ($Rsq=0.288$)
 $Political_dim = 0.410 - 0.045 Fract + 0.004Protestant + 0.003Catholic - 0.053Civ_liber$ ($Rsq=0.905$)
 $Legal_inst = 0.620 - 0.066Fract + 0.003Protestant + 0.001Catholic + 0.551LO_Socialist + (LO_French dropped) + (LO_German dropped) + (LO_Scandin dropped)$ ($Rsq=0.638$),

where *LO_Socialist*, *LO_French*, *LO_German*, *LO_Scandin* are dummies indicating countries' legal origin: Socialist, French, German, or Scandinavian. The English legal origin is used as a reference category.

^a In the case of transition economies, one should interpret the results with some caution due to the limited number of observations for this subsample.

* $p < .10$. ** $p < .05$. *** $p < .01$.

Table 5
The Short-Term Impact of Formal Institutions on Economic Growth, by Phase of Institutional Dynamics

Variables	Countries in the drift phase		Countries at critical junctures				
	Model 1	Model 2	Model 1	Model 2	Model 3	Model 4	Model 5
Ln(GDP growth)	-0.167*** (-2.85)	-0.177** (-2.66)	0.071** (2.68)	0.082** (2.70)	-0.147*** (-3.15)	-0.185*** (-3.99)	-0.129** (-2.10)
Ln(Gross capital formation)	3.333*** (3.43)	2.891*** (3.49)	0.736** (2.49)	-0.239 (-1.01)			
Ln(Inflation)	-0.125 (-1.40)	-0.059 (-0.82)	-0.117*** (-5.59)	-0.247*** (-7.24)			
Legal institutions	4.920*** (4.20)		-1.098* (-1.87)				
Political institutions		-3.315 (-0.60)		14.486*** (6.41)	1.281 (0.48)	-4.242* (-1.76)	-6.028*** (-6.78)
Distance to Cultural dimension					-3.576* (-1.72)		
Political Institutions*Distance to Cultural dimension					7.622* (1.91)		
Distance to Political dimension						4.177*** (3.93)	
Politics institutions*Distance to Political dimension						-8.196*** (-3.64)	
Distance to Structural dimension							-4.965*** (-3.79)
Political institutions*Distance to Structural dimension							5.137** (2.15)
<i>Number of observations</i>	250	209	126	145	101	104	104
<i>Number of groups</i>	45	48	22	26	21	22	22
<i>Number of instruments</i>	21	19	21	19	19	19	21
<i>Hansen test of overid. restrictions</i> (Prob > chi2)	0.173	0.169	0.372	0.145	0.307	0.182	0.312
<i>Arellano-Bond test for AR(2)</i> (Pr > z)	0.460	0.633	0.250	0.232	0.341	0.535	0.591

Note: t-values are reported in parentheses. In addition to the specification choice described in the methodological part of the manuscript, we use the sub-option `noleveleq` that invokes difference instead of system GMM. All the variables specified in the model are included in the `gmmstyle` option. Time dummies appear in the `ivstyle` option.

Alternative specifications of the model, such as the inclusion of time dummies in the main equation, omitting the collapse sub-option, and restricting instruments only to the third or fourth lags of the respective variables, do not change results substantially, which suggests their robustness. In order to achieve acceptable results for the Hansen and AR(2) tests, we use a different specification choice for model 4: instruments are restricted only to the fourth lags, whereas the sub-option "collapse" is omitted.

*p < .10. ** p < .05. *** p < .01.

Table 6
An Extended Analysis of Short-Term Effects of Legal Institutions on Growth Rates for Countries at Critical Junctures^a

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Ln(GDP growth)	0.235*** (42.17)	0.239*** (26.05)	-0.027 (-0.20)	-0.075 (-1.25)	0.005 (0.16)	-0.252* (-1.87)
Legal institutions	-1.404*** (-25.25)	-6.453*** (-5.34)	-25.627** (-2.29)	-2.684*** (-16.75)	-6.229*** (-7.03)	-12.335** (-2.63)
Legal institutions2		4.505*** (4.51)	19.288* (1.94)			
Corruption perception index				0.389*** (4.60)	-0.483*** (-8.76)	-2.115** (-2.63)
Legal institutions *Corruption perception index					1.274*** (7.24)	2.294* (1.96)
Time dummies	no	no	yes	no	no	yes
<i>Number of observations</i>	129	129	129	125	125	125
<i>Number of groups</i>	22	22	22	22	22	22
<i>Number of instruments</i>	21	21	21	18	21	21
<i>Hansen test of overid. restrictions</i> (Prob > chi2)	0.375	0.325	0.576	0.299	0.296	0.707
<i>Arellano-Bond test for AR(2)</i> (Pr > z)	0.358	0.409	0.840	0.253	0.272	0.322

Note: t-values are reported in parentheses. We use alternative specification choices for models 1 – 3 and 6. In particular, we restrict instruments only to the third lags of the respective variables and omit the collapse sub-option. Time dummies are also excluded from the ivstyle option, but are included in the growth equation of model 3 and model 6. The alternative specification choice does not change the relationship between legal institutions and rates of economic growth: Results reported for transition economies in model 1 of table 5 and model 1 of table 6 are similar, suggesting their robustness. Results reported in model 4 and model 5 are calculated based on the specification choices of table 5. To check their robustness, we utilize the alternative specification choice of model 3 of this table and report results in model 6.

^a One should interpret the results with some caution since the countries at critical junctures are in recovery from transition recession for the period of our study. Their relationship between growth rates and institutional indexes is hence likely to be less tight than in somewhat more stable periods. The logic of our results is, however, in line with Fidrmuc and Tichit (2009) who also include data for the outset of transition into their analysis (1989 –2004) but still receive support for the non-linearity in the relationship between formal institutions and economic growth.

* p < .10. ** p < .05. *** p < .01.

Table 7
Predictions of GDP per Capita Levels for Countries at Critical Junctures

Countries	Original GDP per capita (averaged over 1996–2008)	Predicted GDP per capita, given		
		Maximum improvements in legal institutions	Maximum improvements in the three dimensions	Maximum improvements in both legal institutions and the three dimensions
Albania	3.141	3.680	11.896	16.161
Armenia	6.843	7.280	15.476	19.409
Bulgaria	6.409	7.810	14.895	18.413
Croatia	7.234	9.404	15.560	18.074
Czech Republic	10.250	13.008	18.102	19.804
Estonia	14.593	14.860	18.750	22.357
Georgia	4.100	8.461	15.519	19.411
Hungary	7.937	12.654	18.632	19.836
Kyrgyzstan	2.327	8.369	17.284	18.096
Latvia	10.192	14.570	20.622	21.387
Lithuania	8.027	13.797	19.264	22.462
Macedonia	3.410	7.643	14.013	17.980
Moldova	2.665	4.897	14.173	17.107
Poland	7.946	13.031	18.593	21.843
Romania	3.653	10.428	16.676	19.145
Russia	6.391	10.529	18.212	21.975
Slovakia	9.561	12.785	18.454	21.208
Slovenia	14.285	14.390	19.599	20.752
Ukraine	3.566	7.289	15.715	20.243

Note. The predictions are calculated based on the following model: $GDP_per_capita = -9.647 + 0.097Higher_education - 0.096Government_size + 0.031Savings + 6.957Legal_inst + 5.928Cultural_dimension + 13.432Political_dimension + 1.644Structural_dimension$. *Education* is operationalized through enrollment ratios in tertiary education. *Government_size* represents the government size expressed as government expenses for operating activities in providing goods and services measured as a percentage of GDP. *Savings* refers to the percentage of GDP in the form of savings. The World Bank electronic database is used as the main source for the variables above.

Table 1
List of Countries Used for the Analysis

Countries in the drift phase		Countries at critical junctures	
<i>Basic subsamples</i>	<i>Additional countries</i>	<i>Basic subsamples</i>	<i>Additional countries</i>
Algeria	Austria	Albania	Belarus
Argentina	Belgium	Armenia	Tajikistan
Australia	Belize	Azerbaijan	Turkmenistan
Bangladesh	Benin	Bulgaria	Uzbekistan
Brazil	Bolivia	Croatia	
Canada	Cambodia	Czech Republic	
Chile	Comoros	Estonia	
Dominican Republic	Congo	Georgia	
Egypt	Denmark	Hungary	
Ethiopia	Ecuador	Kazakhstan	
Finland	Gambia	Kyrgyz Republic	
France	Greece	Latvia	
Germany	Guinea	Lithuania	
Ghana	Iceland	Macedonia	
Guatemala	Iran	Moldova	
Indonesia	Ireland	Poland	
Italy	Israel	Romania	
Japan	Jordan	Russia	
Malaysia	Kenya	Serbia	
Morocco	Luxembourg	Slovakia	
Netherlands, The	Paraguay	Slovenia	
New Zealand	Portugal	Ukraine	
Norway			
Sweden			
Switzerland			
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